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Australian Co-Ordination Section

H. GRIESBERG
D. SEARGENT
Co-Ordinators

P.O. Box 546 Gosford N.S.W. 2250
Australia

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I N D E X

<u>Item</u>	<u>Author</u>	<u>Pages</u>
Guest Editorial	David Reneke	1-2
Knuckle-Bones, Min-Min lights & Angel Hair	Dr. R. Molnar	2-3
Where is everybody? Speculations on the non-prevalence of extraterrestrials in the universe	John Prytz	4-12
A Possible CE3/Monster case ... Or was it something else?	David Seargent	12-14
A Note on Hypnopompic and Hynagogic imagery	Mark Morawec	14-15
ACOS Bibliography service	John Prytz	15-16
UFO Reports from Around Australia.		17-18

Guest Editorial:

David Reneke

(Investigation & Research Director UFOR-NSW)

1979/80 will be the beginning of a new approach taken by UFO researchers in this country, old adopted methodologies and old fashioned ideas no longer appeal to today's Ufologist, he has seen virtually no real benefit coming from the way he has tackled the problem and has for the first time taken a good hard look at things as they are.

For six years now, UFO research in Australia has boomed, we have seen the formation and operation of ACOS, our national co-ordinating body, and we have seen two new state groups become active -- UFO RESEARCH (FNQ) and UFO RESEARCH (NT). Both these bodies have formed their respective investigative and liaison committees and they have been instrumental in getting reports, both old and new, from areas of the country that previously were inaccessible to us. As well as this we are happy to see the recent formation of a new sub-state group in Tasmania which will enhance the fine work currently being done by the TASMANIAN UFO INVESTIGATION CENTRE.

In all, we have the entire country covered by a separate state group which feeds reports directly to ACOS, at the same time the same data is being recorded in the Australian UFO Computer File (UFOCOM) to allow quick and accurate reference to be made in relation to on going research, like searching for possible early flap periods or isolating certain reports in time and space for comparison and analysis.

With all of this at our disposal we should be in a pretty good position to come up with the much sought after 'hard data' that the scientific community so rightly demands..... well, the truth of the matter is no, we are

not in that enviable position: not yet at least. The problem does not lie in lack of equipment, most of the required material for field investigations is already available. We do not suffer the problem of expertise, we have the services of scientific and technical consultants at our disposal at a moments notice. We do not lack for material, the amount of well researched and documented cases on file with all groups attest to that. What then is the problem?

The problem is simply this: You can amass ten thousand cases, you can document your work until the Sun burns itself out, or you can publish millions of newsletters....the resultant question from a critical and skeptical scrutineer is going to be "so what!" Is he wrong to say this?, I don't think so for the ball is in our court, we must produce a better class of documentation than previously, we must look a lot harder at the type of 'evidence' that is being brought forward and we must do it NOW. It is no use saying you don't have the time or the personnel, that's a 'cop-out'; FIND the time and FIND the personnel, but for heaven's sake, don't leave it at that ... let all of us in on the result. A sad fact of this type of work is that the real effort is being made by a few certain individuals, in a few certain organisations, they are the REAL Ufologists for they ask no reward for their efforts, they freely disseminate their information and they continually seek out new ways to make their work more professional. The people I refer to are the dedicated ones, they CO-OPERATE with ACOS for all our benefits; can you say with certainty that you can stand and be counted?

The amount of bickering, secrecy, apathy, and general discord so rampant in this subject worldwide at the present time is ridiculous! Why must we be so prepared to fight with each other? We're working for the same result, are we not? If we get rebuffs from the press or the public then we deserve it, if there is no cohesion amongst ourselves then how the hell can we ever hope to progress! The key to the whole business is CO-OPERATION, it's a simple word isn't it, but apparently to some it means work; I feel sorry for you if the cap fits for not only do you slow down the research effort but you over burden those who want to get on with the job and see some concrete results for their labours. How about it, will you help us make 1979-1980 the year we began true UFO RESEARCH?

Knuckle-Bones, Min-Min Lights and Angel Hair.

Dr. R. Molnar.

Having read the little note on page 18 of the April 1979 ACOS BULLETIN (which bone are you?), I cannot sit back and allow the knuckle-bones to be maligned. We prefer to consider ourselves as constructive critics, whose intent it is to point out features of potential significance that might otherwise be overlooked. Allow me to present two examples from the April ACOS BULLETIN. In my job, I spend some time every year in central and west Queensland, and hence was interested in Mr. Boundy's article on Min Min lights. Since some of the locals that I have talked with did not believe in the Min Min at all, considering it a kind of tomfoolery for the tourists, I am interested to find out whether these reported lights were seen by locals (some of whom do believe in them, incidentally) and precisely where they were seen. Now I can hardly expect Mr. Boundy to worry about whether or not his informants were locals or tourists, without knowing of the local skepticism (at Boulia and Bedourie), but I can expect some better locality data than "western queensland", which is rather large, or "the Barkly Tablelands", which, while smaller than western Queensland, is still disconcertingly large. This is the whole point of giving locality data, references, etc., to allow someone else, who has the interest and opportunity to INDEPENDENTLY check on the stories presented, and since I have both I would very much appreciate seeing specific locality data, which, for the Min-Min, seems all too often neglected.

My other example of knuckle-boning is a bit different, and concerns Mr. Reneke's article on angel hair from an airliner. This instance gives good locality data but poor information as to the time ("a June afternoon", also described as "one hot Sunday afternoon"). This may seem to be troubling over trifles

(after all, angel hair is hardly the real problem ... or is it?), but as Sherlock Holmes reputedly said "...the little things are infinitely the most important" ('A Case of Identity') and again, "there is nothing so important as trifles" ('The Man with the Twisted Lip'). Let me explain: if we knew the date, we could find the weather conditions, specifically temperature and humidity. Then we would know when to look again (and hopefully photograph) this obviously rare phenomenon. Right, so where does that get us? Presumably since this is a rare phenomenon the unusual weather conditions (a hot June afternoon in Sydney is unusual) affected the fuselage of the aircraft, or more likely something on the fuselage of the aircraft, to produce the angel hair. We can find out the speed of the aircraft at take-off and during the initial climb, I would think easily enough, and should also be able to figure what kinds of substance might adhere to the fuselage (grease, fuel, whatever airliners are cleaned with, assuming that airliners are cleaned, paint etc.) It might then be possible (although perhaps expensive) to reproduce these conditions in a wind tunnel if we were to observe the angel hair again under the same conditions on airliners. If it were reproduced in a wind tunnel, see where THAT would get us: it would have been demonstrated that in order for angel hair to be, there would have also to be an OBJECT passing at (reasonably) high speed through the air. This would demonstrate to (at least some) skeptics the objects in the unidentified flying objects. The skeptics then would have two options:

- 1) to demonstrate that an aircraft can be misinterpreted as, for example, a whitish cylinder preceded by about thirty red spheres, each sphere surrounded by a yellowish ring (Michel, THE TRUTH ABOUT FLYING SAUCERS, 1967 Pyramid ppb. ed., pp. 153-4), or
- 2) To demonstrate that angel hair can form in the absence of any solid object passing through the air.

I am assuming that angel hair has different properties from the silk of ballooning spiders, none of which, to my knowledge, has been reported to 'evaporate' while in a closed jar, as angel hair has. So I think, for the moment, this is a fair assumption. In either case the burden of proof is shifted from the believer (who now has something more substantial than a report or photograph) to the skeptic. Admittedly there are lots of ifs in my argument, if we can get the date, if we can duplicate Mr. Reneke's observation, if we can model the situation in a wind tunnel (if we can get access to a wind tunnel), but here is a potential new route of investigation right under our noses, all because Mr. Reneke, like Mr. Holmes, did pay attention to a trifle. And this also exemplifies to reason for knuckle-bones.

Perusing through different publications, one often comes across articles which makes one wonder. One such article appeared in the Canadian publication RES BUREAUX BULLETIN, January 1979.

"Despite the statements of CBC's Radio Noon program in Ottawa on January 30th, that all UFO reports are available to researchers, I've discovered many UFO reports are "identified" by NRC scientists as 'meteors' and filed separately from the regular UFO reports. These are not available to researchers, and where it was possible to study unfilled UFO reports as they came into the NRC at 100 Sussex in Ottawa. This is no longer allowed until the new 'UFO reports' are checked as meteors first before entered into either the 'meteor' or 'UFO' files. For example, two RCMP occurrence reports were not permitted to be copied as neither had been checked as not being 'meteors'. One report from Gander, Newfoundland, was the full report to N78/232 already residing in the 'UFO' file; and the other was a description of a brilliant UFO which hovered near Prince George, B.C., at Summit Lake, on December 5, and was watched over a period of '5 minutes'. I only had time to glance thru the reports before being advised no one had distinguished whether these were 'meteors' or 'UFOs' and could not be copied. This new policy seems to stem from my discovery some UFO files and incoming reports 'disappear' into the 'meteor' files never to be seen by researchers. How many UFO reports have been detoured into the meteor files where UFO researchers cannot go?"

Where is everybody? Speculations on the non-prevalence of extraterrestrials
in the universe.

by John Prytz

The dawning of the space age has thrust upon humanity the reality that we may not be alone in the universe. Although the question of the existence of intelligent life on other worlds has existed and been answered many times over in the pages of science fiction for many generations now, it is only recently (the current generation) that such speculations have achieved an aura of profound significance and scientific respectability. The current status of such speculations centering upon the existence of extraterrestrials is such that few, if any, scientists now believe we are a unique phenomena in the universe. We, the aliens like us, are the rule, not the exception in the cosmic scheme of things.

Ian Ridpath, a popular writer of astronomy and astronautics, has in a recently published volume, made his most recent contribution to the debate on extraterrestrial life. In his book MESSAGES FROM THE STARS: COMMUNICATION & CONTACT WITH EXTRATERRESTRIAL LIFE: A SCIENTIFIC VIEW (Fontana Books - 1978), he first states that:

"Does life exist elsewhere in space ? This is the most important scientific question which we are currently capable of answering, and certainly the most exciting." (page 9)

He then explains the current situation exobiologists find themselves in relative to finding alien life:

"If a sense of puzzlement, even of paradox, emerges partway through the book, it is an accurate reflection of the reaction of many people, myself included, to the fact that, while life ought to be abundant throughout space, we have as yet found no clear sign of it" (page 10)

Later on he gets to the nitty-gritty of his puzzlement when he leads into a line of argument first developed by Michael Hart of the Goddard Space Flight Center (NASA) in Maryland, USA.

" If there are advanced, star-faring civilizations out in the galaxy, where are they? The apparently innocuous observation that there are no extraterrestrials on Earth has been turned to make a telling point against those who profess that advanced life is prevalent throughout space. If such beings existed, the argument runs, they would have explored and colonized the Galaxy as we have explored and colonized the earth." (page 171)

Aliens should "spread across the Galaxy like ink over blotting paper" says Ian Ridpath.

"Thus we are led into what we might term Hart's paradox: one cannot have abundant extraterrestrials without abundant evidence for them on Earth." (page 173)

The paradox is wrapped up in a chain of assumptions that may or may not prove to be valid. It is the purpose of this paper to explore those assumptions and analyze the many implications whether the phenomena of Hart's paradox is real or only apparent.

The assumptions central to Hart's paradox run roughly like this.

- 1) Extraterrestrial technical civilizations are abundantly scattered throughout the universe.
- 2) Interstellar travel is technically feasible according to known physical laws.
- 3) By analogy with ourselves, exploration and colonization are desirable and should be considered common traits and behaviour for any civilization achieving an advanced degree of technology.
- 4) Within our Milky Way Galaxy, colonization and exploration times comprise a minute fraction of the age of the galaxy.
- 5) There is no evidence this has occurred within our stellar neighborhood in general or on earth in particular.

Therefore, where is everybody?

The general basis for the first assumption relating to the cosmic abundance of technical civilizations is Drake's formula. The number (N) of civilizations with technology is given by: $N = R_* f_p n_e f_l f_i f_c L$ where R_* is the rate of star formation,

f_p is the average number of planets per star

n_e is the fraction of those planets with a suitable environment for life as we know it.

f_l is the fraction of those planets where life does arise

f_i is the fraction of those planets that evolves intelligence

f_c is the fraction of intelligences that develop technology

L is the average lifespan of such a civilization.

The numbers generally plugged into the equation run roughly about:

$$R_* = 10/\text{year} \quad f_p = 1 \quad n_e = 1/10 \quad f_l = 1/10 \quad f_i = 1/10$$

$$f_c = 1/10 \quad L = 1,000 \text{ to } 1,000,000 \text{ years}$$

That translates into from 1 to 1,000 civilizations currently in our galaxy. 500 or so would be a good average. However, when figured over the lifespan of our galaxy, the number would be closer to 10,000,000 (10^7). If one assumes that L is infinite, that a civilization once achieving a technology (space travel) would never die out, then the latter figure of 10,000,000 advanced civilizations is not improbable. The reasoning here is that once a civilization can scatter itself throughout space, no disaster, natural or otherwise can wipe it out. Thus, alien civilizations are commonplace.

The second assumption that interstellar travel is feasible is even less debatable. The distances may be great, the travel times long, the velocities low, But it can be done. We ourselves have launched to date four unmanned probes (Pioneer 10 & 11, Voyager 1 & 2) that will escape our solar system and travel into the stellar reaches of outer space. We could today, given the task, construct a multi-generation starship and send it on its way to the stars. Of course it would take tens of thousands of years to reach even the nearest of our stellar neighbors, but it could be done. There is no need for any fancy science fictional warp drives or hyper-space. Several generations hence the times required could drop to thousands of years, eventually hundreds or even dozens of years of travel time as our technology improves, and all without breaking any known physical laws. Man can fly to the stars today, if given the money and willpower. The exact same physical principles that enabled man to go to the moon, can take him to the stars. If we are on the verge of that sort of ability now, what then of the civilizations that are tens, hundreds, thousands, millions, maybe even billions of years more advanced than us?

But would any civilization want to travel to the stars? Because it seems so natural that we will one day do so, we assume that any (or at least most) other extraterrestrial civilizations would too. What are the drives and/or advantages that would lead any technological society out to the realm of the stars?

Here we can only go by analogy with ourselves. It seems highly logical that any civilization with a technology capable of exploring the reaches of outer space must first of all have an ability in science. Scientific knowledge is obtained through one trait - curiosity. Not only ourselves, but much of the higher life forms on earth exhibit this characteristic. To explore our environment is one desire linking humans everywhere and humans with many of our fellow animals (Anyone who has ever owned a pet cat or dog can testify to that.) Why climb the highest mountain? Why cross the widest ocean? Why go to the moon? Because it is there and we want to see what secrets it may hold. It seems impossible to conceive of any alien race possessing a technology that didn't share this basic (and I believe universal) trait. There is of course other basic motivations for exploration. Exploitation is one - the quest for natural resources, land, riches etc. This reason is very much in evidence when considering our own history of exploring planet earth. Another is survival. Often man has travelled from point A to point B to insure this most fundamental of biological needs. The cause maybe population pressures, drought, or escape from religious or political persecution, but in the final analysis, survival is the key factor.

Thus, I believe that exploration, for reasons of knowledge and/or exploitation and/or survival would be almost a certainty for any and every alien civilization that has as a minimum a technology equal to our own. And, where exploration begins, can colonization be far behind?

Colonization on earth and by earthlings has been part and parcel of exploration. Where ever man has explored he has for the most part established residence. From the birthplace of man he has spread out over the globe, much like ink over a blotting paper, even to the inhospitable regions of Antarctica. Only the ocean bottom and the moon haven't todate been colonized, though the first few steps toward establishing residence on the former have been realized. Few doubt the eventual realization of the science fictional visions of cities on the sea floor and on the moon. And if tomorrow the moon, can Mars et al be far behind?

Reasons for establishing colonies parallel reasons for exploration. Knowledge in this case tends to lose some of its significance, though we of course have and maintain scientific bases in Antarctica. Exploitation and at times conquest are all too obvious as a motivation for colonization. Colonization has been used, as for example in Australia, as a dumping ground for convicts and undesirables. Emigration has always been commonplace as a driving force to establish and maintain colonies. Colonies are established for survival purposes; to protect exploitation activities and established empires. One thinks today of the global network of military bases operated by America, Russia, Great Britain etc.

But of course exploration and colonization of a planet or even a solar system are orders of magnitude below in terms of time, cost and difficulty that of similar activities relative to the stars and our Milky Way Galaxy. Distances to the planets from earth relative to even the closest of our stellar neighbors are as an hour is to a year! Motivations for exploring and colonizing worlds circling other stars would have to be a similar orders of magnitude higher. Are there any?

It would seem that the quest for knowledge could be obtained far more cheaply and safely through remote sensing and unmanned space probes. With respect to exploitation, there are enough minerals and energy (solar nuclear) within the solar system to last us for millions in the case of minerals, and billions, with respect to solar energy, of years. Why go half-way around the world for something you can obtain in your own back yard? It is also difficult to see conquest, for its own sake, as an incentive for interstellar travel. The difficulties in sustaining a military operation over interstellar distances, for no advantage, seems to preclude that as a viable motivating factor. But of course we can't speak for the philosophy behind any alien drives! Perhaps we can't even speak with any assurance with respect to ourselves, giving our long history of often pointless conquests of neighbors. It might be a bit far-fetched, but religion as a force for missionary work, could be seen by some as a reason to travel to the stars and convert the ungodly alien. Then too, maybe they have similar ideas and are even now planning to convert us!

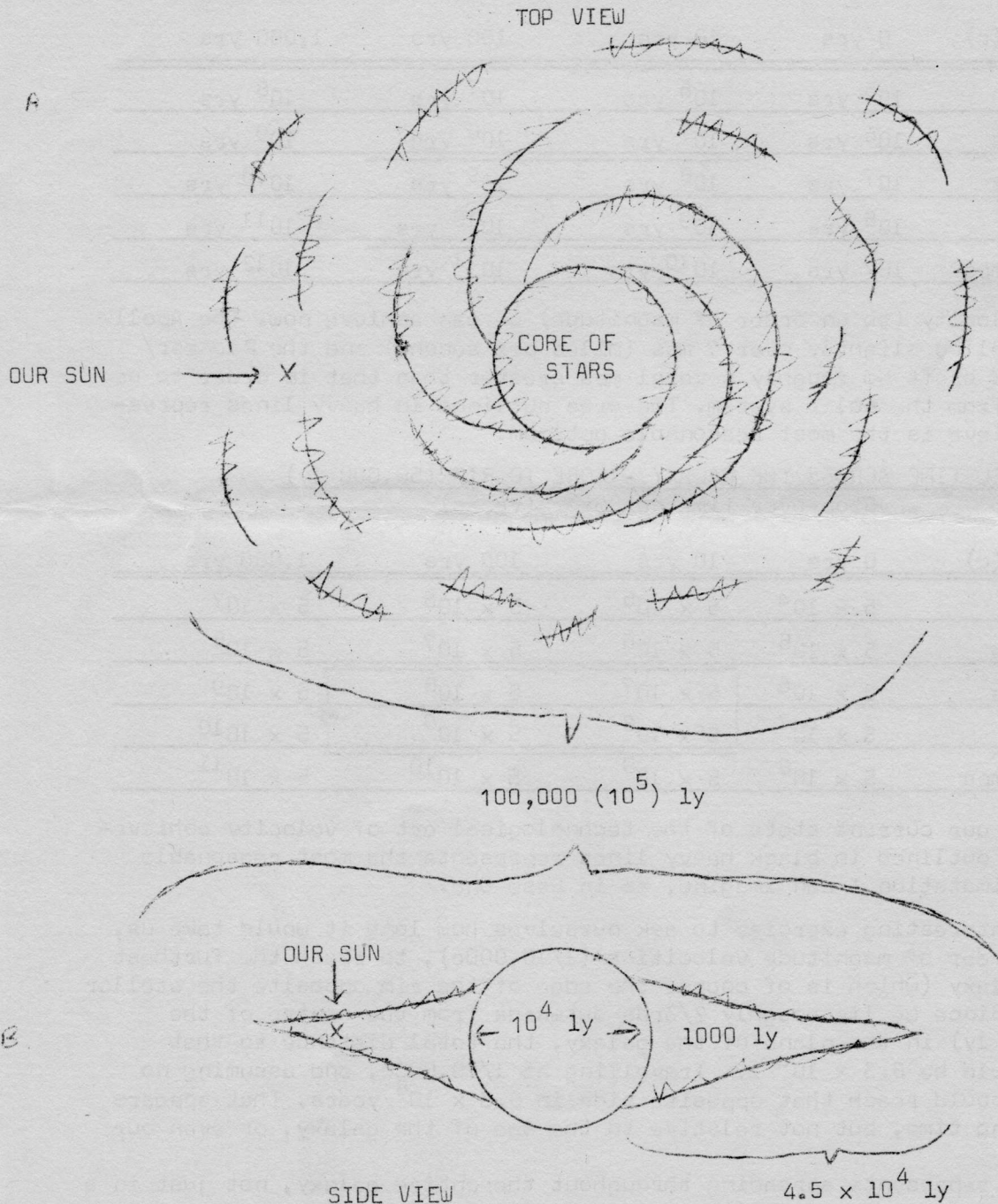
However, when all is said and done, I see only the survival instinct as the key reason for interstellar colonization. It could be argued that it is far better for us to establish military colonies around our nearby stellar neighbors, than to chance some alien race doing it first and representing a future potential threat to earth. Then too, and of greater significance, is the probability that interstellar colonization makes the human race immortal. As mentioned before, no single natural disaster, such as the sun going nova, or an earth-asteroid collision, or any one of a hundred science fictional end-of-the-world disasters, could wipe out the human race in one go, if mankind were scattered among the many worlds of interstellar space. It is highly unlikely that any conceivable method of human activity could wipe out earth and the dozens, hundred or even thousands of worlds that man might be resident on. Interstellar colonization affords the human race a life-span equal to that of the universe. Survival on the grandest of scales. Such a motivation would well drive extraterrestrials out to the stars too.

Dreaming of possible immortality is one thing; reality could get in the way! Travel to the stars is possible, but is it feasible in terms of the times required? There is little point in trying to colonize the galaxy if the time required to do so is orders of magnitude greater than its lifespan. This brings us to the fourth assumption. A few basic facts are necessary first to establish the parameters that will confine us, then some further assumptions needed to further restrict our speculations. The facts relate to the size, shape and volume of our galaxy, its age, and the number of stars (possible targets) in it.

The Milky Way Galaxy is one of many that astronomers classify as being spiral.

It is far wider than it is thick, and consists of a densely packed core of stars roughly 10,000 (10^4) light years (ly) in diameter, which taper off (when seen edge on) on either side for roughly another 4.5×10^4 ly. That gives a total diameter of roughly 100,000 (10^5) ly. The average thickness either side of the core is about 1,000 (10^3) ly. (see diagram next page)

That rounds out to be a volume of about 8×10^{12} ly³. There are roughly 10^{11} stars in our galaxy, or 80 ly³ for each star (on average). That translates into an average separation of slightly over 4 ly between each star. The distances are of course far less (about 1 ly) in the core, and correspondingly greater out towards the edges of the galaxy. The current best estimation of the age of our galaxy is from 10 to 15×10^9 years old. In contrast, our solar system and planet earth has been dated as coming into being only about 4.5×10^9 years ago.



The number of stars across the galaxy from rim to rim (seen edgewise) would be roughly 32,500 (3.25×10^4 stars), of which 10,000 (10^4) would be in the core.

The first assumption relates to the possible speed one can travel across space. For sake of argument here, I assume that the speed of light just exceeds the maximum velocity possible in accordance with known physical law as currently believed. There thus exists no magical hyper-space or other science fictional way of super-speed travel to the stars. All velocities are therefore fractions of the speed of light.

The second assumption subtracts from the age of the galaxy the minimum time required for a civilization (with technology) to arise. Based (to an order of magnitude) on ourselves, I place this to be on the order of 4×10^9 years. Is this enough time to colonize a galaxy the size of ours? Within these constraints we can now speculate.

The maximum time to go from rim to rim of the galaxy depends on the distance across, and the stop-over time at each star and the speed travelled. There are two extremes possible. Either a civilization on the rim can travel across to the other side, or else a civilization located in the middle of the core can expand outwards towards both rims at the same time. In the former case, the distance to be negotiated is 100,000 (10^5) ly. In the latter, the distance is only 1/2, or 50,000 (5×10^4) ly. Lets take the rim-to-rim situation first.

CASE ONE - TRAVEL TIME ACROSS THE GALAXY - RIM TO RIM (100,000 ly)

Velocity (as a fraction of the speed of light (c))	Stop-over Time per Star (years)			
	0 yrs	10 yrs	100 yrs	1,000 yrs
c 186,000 mps	10^5 yrs	10^6 yrs	10^7 yrs	10^8 yrs
1/10c 18,600 mps	10^6 yrs	10^7 yrs	10^8 yrs	10^9 yrs
1/100c 1,860 mps	10^7 yrs	10^8 yrs	10^9 yrs	10^{10} yrs
1/1000c 186 mps	10^8 yrs	10^9 yrs	10^{10} yrs	10^{11} yrs
*1/10,000c 18.6 mps	10^9 yrs	10^{10} yrs	10^{11} yrs	10^{12} yrs

*This is the velocity (to an order of magnitude) we can achieve now. The Apollo astronauts travelled slightly over 7 mps (miles per second) and the Pioneer/Voyager unmanned craft do roughly several mps greater than that in order to be able to escape from the solar system. The area outlined in heavy lines represents what I believe is the most reasonable optimum.

CASE TWO - TRAVEL TIME ACROSS THE GALAXY - CORE TO RIM (50,000 ly)

Velocity (as a fraction of the speed of light (c))	Stop-over Time per Star (years)			
	0 yrs	10 yrs	100 yrs	1,000 yrs
c 186,000 mps	5×10^4	5×10^5	5×10^6	5×10^7
1/10c 18,600 mps	5×10^5	5×10^6	5×10^7	5×10^8
1/100c 1,860 mps	5×10^6	5×10^7	5×10^8	5×10^9
1/1000c 186 mps	5×10^7	5×10^8	5×10^9	5×10^{10}
*1/10,000c 18.6 mps	5×10^8	5×10^9	5×10^{10}	5×10^{11}

*Again, this is our current state of the technological art of velocity achievement. The area outlined in black heavy lines represents the most reasonable range of guesstimatation I can imagine, as in Case One.

It is an interesting exercise to ask ourselves how long it would take us, using current order of magnitude velocities (1/10,000c), to reach the furthest point in our galaxy (which is of course the edge of the rim opposite the stellar core from us.) Since we lie roughly 2/3rds outwards from the centre of the core (3.3×10^4 ly) in the plane of the galaxy, the total distance to that opposite rim would be 8.3×10^4 ly. Travelling at 1/10,000c, and assuming no stop-overs, we could reach that opposite side in 8.3×10^8 years. That appears a very, very long time, but not relative to the age of the galaxy, or even our own earth.

Case Three represents spreading throughout the entire galaxy, not just in a straight line either rim-to-rim or core-to-rim. This depends of course on the total number of stars in the galaxy (10^{11}) and the volume (8×10^{12} ly³), as well as velocities achieved and stop-over times. It makes for a more complicated problem when dealing with three dimensions instead of one as is the first two cases.

However, Case Three is really nothing more than an extension of Cases One and Two, only spreading outward in all directions and not just in the galactic plane. Clearly there are many strategies that could be employed for galactic exploration. What is the best strategy to minimize the times required?

If one sends out only one colony starship which leaps from star to star, then clearly the time it takes to explore each and every one of the 10^{11} stars, average distance 4 light years apart, is even at speed of light travel not less than 4×10^{11} years. That doesn't include any stop-over times or time taken for doubling back and recrossing pathways. Therefore even the minimum time required to explore and colonize the galaxy via this strategy is clearly greater than the age of the galaxy. Even if one sends one spaceship each year, one to each and every star, the time required would take at least 10^{11} years, again greater than planet to send out 10^{11} starships seems a bit much.

However, if one extraterrestrial civilization that has achieved the ability to launch interstellar spaceships for the sake of exploration and colonization, sends out say 10 such expeditions, one each to each of the 10 closest stellar neighbors over a short time period (10 years or so), then stops because the surrounding area is now saturated with colonies, and after allowing for suitable travel and stop-over times to those 10 colonies, each of those colonies sends out 10 further expeditions, and so on, the galaxy could be covered in far less time than would otherwise be the case. This strategy sets up a "ripple" effect with the alien race spreading ever and ever further outwards from the parent star. The rate of this "ripple" expansion depends on the combined times taken to travel to outward stellar systems (velocity) plus the average stop-over durations.

Expansion Rate (as a fraction of the speed of light (c))	Time Required to Negotiate the Maximum Distance Possible Within the Galaxy (about 100,000 ly)
1/100c	10^7 years
1/1000c	10^8 years
1/10,000c	10^9 years
1/100,000c	10^{10} years

} Most probable range

For a civilization located in the galactic core, the maximum travel distance is only half that for a galactic rim civilization, hence so is the corresponding times required. Because stars are far more numerous in the core, the odds are that first expanding civilization would have arisen there. Thus, I suggest that the most likely time for galactic colonization would be between 5×10^8 and 5×10^9 years. The average of this suggested range is 2.7×10^9 years.

Without resorting to a lot of detailed mathematics, it is clear that by using enough starships, sent out by an ever increasing base of colonies, over short enough time periods, and assuming a reasonable rate of "ripple" expansion, the galaxy can be explored in total, the total time equal to the time it takes to cross the greatest distance. Now is that total time adequate?

Recall that the suggested age of our galaxy is from 10 to 15×10^9 years old. For sake of argument, let's take the minimum figure of 10×10^9 years. From that we subtracted the time it would take that first technical civilization to arise, a figure suggested to be about 4×10^9 years. That leaves 6×10^9 years for that civilizations (and others) to explore and colonize the galaxy.

Using what I believe are conservative and realistic assumptions regarding velocities, strategies, stop-over times, and the time it takes that first civilization to arise, I conclude that the argument that exploration and colonization of our galaxy by an alien race(s) is possible and could have happened already.

For direct line rim-to-rim exploration and colonization, 10^9 years seems reasonable. That's only 1/6 of the time span allowed.

For core-to-rim exploration and colonization, half that figure or 5×10^8 years suggests itself. That is of course only 1/12th of the minimum time span allowed.

For exploration and colonization of the entire galaxy for a galactic core civilization, a figure of 2.7×10^9 years has been suggested. That's roughly half the time allowed.

And what if the age of the galaxy is 15×10^9 years old or greater? What if it only takes a civilization a billion (10^9) years to arise instead of four times as long? What if velocities in excess of the speed of light really are possible? Those factors can only increase the probability that extraterrestrials should be abundantly scattered throughout the Milky Way Galaxy.

So if alien civilizations with technology are commonplace, and if interstellar travel is possible, and if exploration and colonization are likely, and if the time periods needed are only fractions of the times necessary for such activities, WHERE IS EVERYBODY?

That brings us to the fifth assumption. There is no hard core evidence on earth, or in space, yet discovered, that provides us with the proof of the pudding. I'll let that stand as self-evident, and return to it later.

Resolutions I - The Paradox Is Invalid As Assumptions (1 to 4) are Invalid

If alien technical civilizations are not common (or non-existent except for ourselves) in the galaxy, something must be wrong with the numbers plugged into Drake's equation. The factors of R_* and f_p and n_e are based on actual or suggestive astronomical evidence and are pretty safe. Data regarding the other factors are highly uncertain and are based a lot on probability at best and educated guesswork usually. It could be that the origin of life (f_1) is highly improbable, though all indirect evidence suggests otherwise. Perhaps intelligence (f_i) is not usually a trait that biological evolution selects for, although it is difficult to imagine why that would be so. Perhaps the conditions necessary for technology to develop are highly improbable. Natural resources maybe rare on most planets of the kind necessary for technology to develop such as highly concentrated metal ores, fossil fuels, nuclear energy etc. Perhaps most civilizations are found in marine environments. Our own dolphin, though highly intelligent, could never obtain a technology. It lacks the type of appendages necessary for the manipulation of tools (hands) for one thing (though its flippers are well adapted for function in a marine setting). Above that, the discovery of fire would be impossible for any subsurface marine intelligence. So, earthlings may be universal freaks when it comes to owning technology (f_c). If we are atypical when it comes to having intelligence and a technology, then we could be so atypical as to be unique.

Finally we come to civilization lifespans (L). It could be possible that L is so short, that no civilization has yet lived long enough to even have a fighting chance to reach the state of development that will permit interstellar travel and insure virtual immortality. Wars, natural disasters, predators etc. may wipe out 99.99% of all budding civilizations before they even come close to reaching the stage of space travel. I personally find that speculation to be a bit on the improbable side.

With respect to the second assumption relating to the ease of interstellar space travel, one would have to offer as a counter suggestion that space flight is a great deal more difficult than has todate been proposed. So difficult in fact, that any technical civilization finds such a task daunting and turns its abilities elsewhere. Or perhaps it is the cost. Or perhaps even it is the lack of a moon! Would we have ever bothered with manned space flight if our own Luna wasn't so close as to be an easy first step toward the stars. What if a civilization around a star far away had no other planetary companions in which to travel to first and test out their space legs? Would their first attempt be something so difficult as an interstellar crossing? However, I feel it safe to say that single planet stellar systems, and/or planets without moons are the exception, not the rule, if our own system is any guide.

Perhaps technical alien societies turn out to be as a rule so introverted that they never even consider space flight as something even worth their while. Only extroverted societies may ever desire to explore the strange new worlds of outer space; we may be it! And what if a civilization never even realized that such a thing as outer space and planets and stars even existed? One can picture an alien civilization on the surface of Venus living in an environment of 100% cloud cover, 100% of the time. Would they ever figure out such a thing as a star? It's interesting to note that the majority of planets in our solar system that have atmospheres have opaque ones in the visible region of the spectrum.

I see no fault in the third assumption that exploration and colonization are desirable, only in the methodology for achieving those goals. Exploration

can be carried out by unmanned probes, or by using manned spaceships that however do not reveal their presence to any other planetary civilization. As to colonization, to achieve that immortality, one does not of necessity have to utilize planetary bodies. Gerard K. O'Neil (Princeton University) was the originator of an idea that earthlings should construct huge artificial space colonies and live in them. Though these would at first be utilized in the regions of space near the moon, they could eventually be placed anywhere in the solar system, in interstellar space itself (though that is less likely as it cuts off an energy supply (solar energy)) or around alien star systems. Colonization is achieved, immortality assured, and never a planetary body, inhabited or otherwise, need be landed upon. Minor space debris (meteors and asteroids) would supply the raw materials. Aliens could have taken this road to the stars and their presence would be difficult to detect.

As with the fourth assumption, by taking extreme cases such as velocities as low (or lower) than $1/10,000c$ (18.6mps) and stop-over times per star of 1,000 years (or greater), it is possible to conclude that galactic colonization is not feasible. The time would be several orders of magnitude greater than the current age of the galaxy. All one has to do is sincerely believe that such velocities represent the maximum or most readily obtainable by even an advanced alien civilization, and that stop-over times greater than 100 years by at least one order of magnitude are of necessity logical. I myself don't. Or, one could suggest that aliens are dumb and have chosen an illogical and highly time consuming strategy for their galactic exploration and colonization.

I'm not however satisfied that any one objection raised in the first four assumptions, or combination of objections, or all of them together can totally account for a resolution of the paradox. To me, the merits and logic behind those four assumptions are stronger than their faults. Thus, I suggest the resolution lies either central or peripheral to the fifth assumption that there exists no "smoking gun" pointing its way toward the elusive alien.

Resolutions II - The Paradox Is Invalid As Assumption Number Five Is Invalid

There is no argument that proof positive is not currently at hand that demonstrates extraterrestrial abundance. However, there are suggestive lines of evidence plus other numerous possibilities to account either for the existence of aliens or why evidence isn't in evidence. One would do well to keep in mind the old saying that lack of evidence is not the same as evidence of lack.

The O'Neil artificial space colony is one such possibility, though I don't believe each and every star-faring alien civilization would take that pathway. Perhaps with hindsight, thousands of years from now, artificial space colonies will have proved to be the only way to fly!

Much speculation has addressed itself toward the problem of how an alien civilization would view us. If some ideas prove correct, they would also explain how aliens could be commonplace and still be undetectable to us. Obviously the extraterrestrials themselves have a large say in just how much evidence they leave scattered around for us to notice. In fact, they might well take great pains to hide their presence.

It has been strongly suggested that if we ever receive a radio message from the stars, the last thing we should ever do is answer it for fear of attracting attention to ourselves and revealing our location and inviting invasion. Perhaps all other alien races hide as much as possible fearing similar fates.

If aliens are within our solar system now, they might deliberately avoid contact with us. Perhaps they are just sitting back and waiting for us to mature a bit more. Perhaps they have no intention of ever letting us loose out of the solar system to run amok through the galaxy - the quarantine hypothesis - where there would be little to gain by giving us advanced warning of their intentions. Then there is the zoo hypothesis, but we are on the wrong side of a one-way mirror. Planet earth is the natural cage and we are the star attraction! No point in frightening the animals! Study them in their natural state so to speak! Akin to that idea is the Star Trek philosophy of non-interference in alien affairs, only we are the aliens having the affairs! Well at least it's more pleasant than having us considered as we would consider a colony of ants!

The question of Hart's paradox as related by Ian Ridpath doesn't of course take into any consideration or even touch upon either UFO's or von Daniken type ancient astronauts as evidence worthy of mention. Needless to say the option of

considering those sorts of things quasi-evidence for alien abundance is the least an open mind can do.

Finally, and probably the best bet, we just don't really know what type of evidence to look for. We might not recognise evidence for extraterrestrial abundance if it walked up to us and said "take me to your leader"! There could be a superabundance of types of evidence out in space attesting to extraterrestrials, if we only recognised it. Astronomy may be an old science, but its catalogue of phenomena, natural and just perhaps otherwise, is far from completely explained yet. We can easily recognise human phenomena because we're one ourselves - something the product of someone very totally alien is, well, another ballgame, the rules of which we don't yet understand.

So where does all this leave us?

Human beings (aliens) have multiplied, set out to explore and colonize, and succeeded in spreading themselves across the globe (cosmos). The net result is that it is impossible today to go anywhere on the face of the earth (in the universe) without either meeting fellow human beings (aliens), or at minimum detecting man's (alien's) handiwork as master of the environment. His results as technological wizard would be evident everywhere, unless one is deaf, dumb and blind.

Is the analogy valid? Are we deaf, dumb and blind?

Obviously I won't resolve the paradox to the satisfaction of all. Just as obviously the paradox is not real, only apparent. One of the five assumptions is seriously in error. If that isn't true, then the only resolution is to either assume that we are deaf, dumb and blind (through our own nature) or else the aliens are deliberately keeping their presence well hidden from us. I personally hope that the latter is not the case and that the evidence justifying the first four assumptions is forthcoming immediately (if not sooner!).

A Possible CE3/Monster Case ... Or was it something else?

D. Seargent

If you are in the habit (and I hope you are!) of keeping old BULLETINS in places where you may easily find them, please go and fetch Number 8 and turn to page 16 (the last page) and there you will find a very scary-looking drawing of a "thing" seen climbing a cliff at Crackneck Point lookout, NSW. The case was included as a possible CE3 because it happened during a small flap of sightings in the area and because it co-incided with an orange light on the sea. Further investigation by the writer, however, identified (with a fair degree of certainty) the light as being a fishing boat which is often seen in that position (there is a reef of rocks near the reported position of the light).

The plot has, as they say, thickened however with another monster sighting from the same spot (Crackneck) - this time involving several witnesses - on April 3, 1978. Some very good character references were obtained this time and there was no doubt about the extreme terror experienced by the witnesses. Then, only a few nights later, it happened again - complete with pulsating lights mysterious footfalls and "cold feelings!"

In fact, a little enquiry discovered that it has been happening at that lookout for at least 8 and possibly 13 years, usually at rather irregular intervals with about 18 months or two years breaks between. Moreover, talks with young people who frequent the lookout uncovered quite a list of strange happenings including dark shapes seen in the reserve (to the south of the lookout itself), mystery footsteps, shadows in the moonlight (which seemed to be uncaused by any solid body) lights at the foot of the cliff and bluish lights on or under the ocean, cold waves of air and an "invisible man" who sits on the backs of parked cars!

Moreover, during the April 3 incident, a cassette player was reported to have malfunctioned indicative of some electromagnetic effect. In apparent confirmation of this, a local family told me of an incident many years ago when an approaching thunderstorm created an electrostatic field at the foot of the Crackneck headland. So strong was the field that the witness' hair stood on end and the wool on the lady's jumper did likewise.

One intriguing aspect of the creature sightings was the reports that it "just vanished" when approached. This applied both to the black shape in the trees and to the white creature seen on April 3.

In general, the descriptions of the white creature were fairly regular and indicated a hairless "thing" about 7 or 8 feet tall. The October 10 (1976) witnesses estimated it somewhat taller than this while the witness to the April 78 sighting (i.e. the one after April 3 - exact date unknown) estimated it as only a little over six feet. However, the first was looking up at the creature and may have suffered from the optical illusion known as "moon illusion" whereas the second saw it down the cliff-face and this may have given rise to an underestimate. The chief witness of the April 3 incident estimated 6'8".

Now, the BIG question is "Does a monster really lurk out at Crackneck?" It does not seem to be UFO related - at least not primarily - but IF it turns out to be genuine and IF the electromagnetic effect can be substantiated some general connection just might be possible. For this reason, it continued to be of interest to UFO investigators.

Well, as it happens, the case has not stood the onslaught of investigation as well as it looked (at first) capable of doing. This slow alteration from an incident of high strangeness to something mundane will, perhaps be better followed if the various explicable points are listed.

1.) THE CASSETTE PLAYER. This malfunctioned about 20 minutes after the creature vanished, apparently while the witnesses were sitting in their cars being "calmed down" Mr. F. (a man who lives near the lookout and who was brought there as an "outside witness" by some of the initial witnesses). The recorder had new batteries but apparently began to malfunction while playing softly and the meter reader continued to malfunction even after the instrument had been switched off. Later, the batteries were found to have gone flat.

Although the recorder could not be examined, the symptoms were given to an expert in such matters who suggested that it was a short circuit. Later information that "the recorder has not worked since, except when you shake it" confirms this as does the fact that the recorder was new. It is possible that it contained a loose wire which was knocked adrift in the excitement of that night, or even when the car hit a hole in the road. As there was no other indication of EM activity, this seems the most likely explanation.

2.) LIGHTS. The pulsing light in the sky was probably the star Canopus or even aeroplanes ('planes can be seen coming in to Mascot - Sydney - and these are often viewed at peculiar angles giving strange effects). The lights on the sea and beach were almost certainly phosphorescent organisms. (it may be relevant to note that The Entrance sewer discharges nearby and - though tertiary treated - has been blamed for an excessive growth of plankton in the area. Some of this may be luminous).

3.) NOISES. Most of these have been identified as boats on the water or simply ordinary night sounds magnified in the still air.

4.) SHADOWS, COLD SPOTS et.al. No obvious solution to the shadow and invisible man except to say that, once an area is given a "reputation" ANYTHING takes on a supernormal significance. Cold draughts and the like must be considered normal for a headland overlooking the ocean (convection currents and the like).

5.) THE CREATURES. This, of course is the main kernel of the Crackneck story. What are these dark and white apparitions which cause so much fear at this lover's lane? At this stage we cannot be certain, but there does appear to be evidence that the "monster" may be an eccentric semi-hermit who lives close to the lookout and who (it is said) has what he believes to be grievances against the lookout's being there. Could this man be sufficiently unbalanced to dress up as a monster and keep up this act for the years that the "thing" has been seen?

The plot has thickened a little in recent months, as the small house in which this man lives seems to have been sold - a young family is now using it, apparently as a weekendender, ... but the sightings still go on. Just before Christmas, some CB operators reported a huge "hairy thing" in the bush at the

southern end of the lookout - at two o'clock in the morning!

This sighting (coupled with the apparent absence of the eccentric) may shed a different light on the whole affair, although the chances are fairly high that it was a CBers hoax.

Whatever the true nature of the "creature" turns out to be, the case is an interesting one for the amount of mundane, circumstantial, evidence which has accumulated into a legend surrounding it and for the fears of those visiting the area - fears which tend to turn normal events (a cool breeze and the like) into things supernatural. This alone, makes the case interesting to the UFO researcher, as here also much circumstantial evidence can accrue to make a "good case".

Also, if the "creature" really is an eccentric man, the similarity between this case and many of Keel's lover's lane monsters in "Strange Creatures from Space and Time" (lets call them "Abominable Lover's Lane Louts or ALLs") may suggest, not a world-wide type of monster, but a world-wide form of human perversion!

A Note on Hypnopompic and Hypnagogic Imagery.

Mark Moravec.

Keith Basterfield (1978) has drawn attention to the possible role of hypnopompic (intermediate state between sleep and wakefulness) and hypnagogic (between wakefulness and sleep) imagery in explaining some UFO close encounter cases. Just how many cases can be explained as due to such hallucinated imagery is an important matter, which is not helped by the lack of adequate documentation accompanying some UFO cases. Also, as Reed (1972) notes, there has been little experimental examination of hypnopompic/hypnagogic imagery or its connotations.

In the Palma, Spain case of July, 1967 (listed in Basterfield's article), the witness awoke at 3 am to see an intense light and two small entities at the window. Upon investigation, she found two small footprints just outside her window. This detail suggests the occurrence of objective, physical phenomena, at least in this case. Of course, it might be argued that the footprints were coincidental, natural depressions in the snow. Adequate case documentation is required to resolve such a point.

Another case, in which it is tempting to explain as due to hypnopompic imagery, is cited in David Seargent's (1978) recent book. Late August 1975. Seattle (Washington). A young lady awoke around 2 am to discover that she was totally paralyzed and unable to utter a single sound. Her window was open, and suddenly a tiny football-sized object of a dull grey colour floated in through it and hovered over the carpet near the foot of her bed. As she watched, three tiny tripod legs extended and the object settled onto the floor. Once landed, a miniature ramp extended from the object to the floor and five or six tiny beings clad in tight fitting black clothes climbed down the ramp made some repairs to the object, climbed back inside again, withdrew the ramp and took off in the object. As soon as the object sailed out of the window, the woman was again able to move and speak. She is quite convinced that the whole episode really took place and was not a dream. (p.60).

In this case, a key feature is the total paralysis of the witness. Is this an objective, physiological occurrence or a subjective, psychological occurrence due to fear? (Of course, a TOTAL paralysis for several minutes and involving vital internal organs such as the heart would probably lead to death, so we are really talking about a partial state of paralysis or anaesthesia.)

My first main point is, that when analysing a case suspected to be explicable in terms of imagery, we need to clarify just what, if any, objective physical manifestations accompanied the incident. If physical manifestations have occurred, the incident can't be explained as simply due to imagery.

Secondly, as David Seargent emphasises, cases of "mini-UFOs" are on face value absurd - and hardly a plus for the extraterrestrial intelligence hypothesis. If hypnopompic and hypnagogic imagery can explain many of the more bizarre UFO cases (which is by no means certain), an attempted explanation integrating psychological manifestations and "nuts and bolts", extraterrestrial intelligence

manifestations becomes more tenable.

Thirdly, it is striking how many of the cases, which might be explained as due to imagery, contain "classic" features paralleling apparently inexplicable CE3 experiences which occur while the witness is fully awakened. For example, in the Palma, Spain case we have the large heads and huge eyes of the entities and the "electromagnetic effect" of the light which can't be switched on. In the Seattle, Washington case, we have the paralysis of the witness, the tight-fitting black clothes of the entities and the "repairs" activity.

Perhaps, in imagery cases, these features occur because of the desire of knowledgeable witnesses to have a UFO experience (as Keith Basterfield suggests in the Ivy Tank case). Alternatively, there may be wider implications for all CE3 cases: (1) the "classic" features of the CE3 experience have so permeated the consciousness of people that it is now redundant to use the argument, as is often done, that Case B is probably authentic because it includes the classic features which occurred in Case A: or (2) all CE3 experiences largely involve a subjective, psychological component manifesting in the form of certain universal classic features.

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UFO REPORTS FROM AROUND AUSTRALIA.

Although we are now half-way through this year, the number of reports received is an all time low. Whether this is due to reports not yet finalised or whether there have not been too many reports only time will tell. There is however, a world-wide trend at present which shows that things are unusually quite as far as UFO sightings are concerned.

TA79051 30th March 1979 2140 Maatsuyker Island CE2 TUFOIC

Two people were outside to take weather details, when they noted a large boat passing to the south. Then, a yellowish light was noticed above the boat, growing in size as if coming straight towards the witnesses, until it was about 4 inches (100 cm) in apparent size and giving off an intense glare that lit up the southern side of the island. The witnesses' dog reacted at the approach of the light. It was too bright to look at directly, when within seconds it went dark again, turning around, and going directly away, shrinking in size. Viewed through binoculars, there seemed to be a bright light reflecting onto a dark cigar-shaped object beneath it.

The light was estimated to be at about 800 feet high, came within 1 km of the island then dropped back to about 10 km.

The witnesses watched the light until about 1.30 am, the dog quietening about 11.30 pm. At 1.20 am the light travelled from S to SE to stop near the South East Cape. It then became 2 blue lights. The witnesses by this time were tired and went to bed.

TA79068 4th March 1979 2200 Pipers River NL TUFOIC

Ten people were sitting around a campfire when they noticed a bright orange light above sea-level which was hovering for approximately 10 minutes. While in this position, there was a bright red reflection coming off the water underneath the object. The object suddenly manoeuvred closer to the coast, tilting at an angle and disappearing into the ocean. When first seen, the object was cigar shaped, then changing to a saucer-shape as it angled to dive into the sea.

TA79028 5th February 1979 2150 Lawitta CE2 TUFOIC.

A 18-year-old man departed Hamilton at about 9.30 pm on a fine clear evening, driving alone to Hobart, about 71 KM away. The next thing the witness knows is that he is in Hobart Hospital with a nurse shining a light into his eyes. It was then that he recalls some details of an event that occurred about 42 KM from Hobart, about 9.50 p.m.

There was little traffic on the road, and he recalls that first his radio in the car died out, he pressed the station buttons but the radio remained dead. Only seconds later, an intense white light seemed to envelope the car and he could not see beyond the end of the car's bonnet. The car lights and motor all failed in the same instant. Beyond this things are only vague.

He thinks he tried to restart the car when he realised the engine had stopped. He thinks there may be 10 minutes or so during which he was stopped.

The witness remembers driving about 21 KMs from Hobart when he was stopped by the police in the city for driving without lights.

He did not know where he was going, who he was or where he lived. The police found his address on some personal papers and took him home.

The father and son at the house where the witness lived took him to hospital as he was in a dazed condition. The head of the house stated that checks showed the witness had a pulse rate of 100 and was in a state of shock, when a

(18)

nurse shone a light into his eyes he backed away as if scared and seemed to recover his memory, although unable to recall all of the event. The car had a flat battery and was low on oil. The witness stated that puzzled him as the car was checked 3-4 days prior and had not been driven until that evening.

The cutout switch in the alternator needed replacing, also some of the wiring especially to the headlights. The old wires were bubbled as if overheated.

The main points in the witnesses favour was that TUFOIC only found out about the case through other sources, and the witness was reluctant at first to discuss the matter. The witness was asked if he was willing to undergo hypnotic regression, but the witness did not wish this and is not interested in finding out what had happened as he has no interest in the UFO phenomenon.

Reports so far received this year are as follows:

	<u>Identified</u>	<u>N.L.</u>	<u>CE1.</u>	<u>CE2</u>	<u>CE3</u>	<u>DD</u>
UFO Research (NSW)	19	4				4
Tas. UFO Inv. Centre	58	3	1	2		
UFO Research (FNQ)	4	5	2	2		

QB79008 16th January 1979 2215 Bramston Beach CE2 UFOR(FNQ)

A 26 year old lady was driving home from work when she noticed what she thought to be the moon behind some trees to her left. She then realized that the moon was actually high in the sky to her right and $\frac{3}{4}$ full - thus it could not be the moon. The object was perfectly round and golden in colour. Shortly thereafter, the car headlights began blinking on and off, then went off completely. It was not until the object was quite some distance behind her that the headlights came on again.